

What is claimed is:

- 094594-1100
- \1. A generally planar substrate of tissue paper, said substrate having a length direction and a width direction defining an XY plane and a Z-direction perpendicular thereto,
said substrate having a thickness taken in the Z-direction, said substrate being extensible in at least one of said length direction and said width direction, whereby plastic extension of said substrate to a percentage in either said length direction or said width direction of said XY plane yields a percentage increase in thickness greater than said percentage elongation in said XY plane.
 2. A substrate according to Claim 1 wherein said substrate has apertures therethrough prior to said plastic extension.
 3. A substrate according to Claim 2 wherein said apertures are elongate
 4. A substrate according to Claim 3 wherein said elongate apertures are generally parallel.
 5. A substrate according to Claim 4 wherein said elongate apertures are unilaterally offset from adjacent apertures.
 - \6. A multi-ply tissue product, said tissue product defining an XY plane and a Z-direction perpendicular thereto, said tissue product having a thickness of at least 2 mm and a density of less than 0.01 g/cm^3 .
 7. A tissue product according to Claim 6, having a machine direction and a cross machine direction orthogonal thereto, said tissue product having a cross machine direction flexibility of less than 0.01 kg/cm^2 .

8. A tissue paper, said tissue paper having a first thickness, said tissue paper being plastically activatable in tension whereby said tissue has a second thickness upon activation, the ratio of said second thickness to said first thickness defining a thickness index, said thickness index is at least 4.
9. A tissue paper according to Claim 8, wherein said tissue comprises cellulosic fibers.
10. A tissue paper according to Claim 8, wherein said tissue comprises synthetic fibers.
11. A tissue paper according to Claim 9, wherein said thickness index is at least 6.
12. A tissue paper according to Claim 8, wherein said thickness index is at least 10.
13. A tissue paper according to Claim 11, having a machine direction and a cross machine direction orthogonal thereto, said tissue paper having an elongation in said cross machine direction of at least 30% without rupture.
14. A tissue paper according to Claim 13, wherein said tissue paper has an elongation in the cross machine direction of at least 60% without rupture.
15. A generally planar tissue paper comprising at least two plies joined in face-to-face relationship, said tissue paper having a length direction and a width direction defining an XY plane in a Z-direction perpendicular thereto, said tissue paper having a thickness in said Z-direction, said tissue paper being plastically extensible in at least one of said length direction and said width direction, whereby plastic extension of said tissue paper causes an increase in said thickness of said tissue paper.
16. A tissue paper according to Claim 15, comprising at least three plies joined in face-to-face relationship, two outboard plies and at least one center ply

therebetween, each of said plies comprising a tissue paper substrate having a pattern of lines of weakness therein, said pattern of lines of weakness of said center ply being different than said pattern of lines of weakness of at least one of said outboard plies.

17. A multi-ply tissue paper comprising apertures therethrough, said multi-ply tissue paper having a coefficient of friction of at least 1.8.
18. A tissue paper according to Claim 17, having a coefficient of friction of at least 2.2.
19. A tissue paper according to Claim 17, wherein said tissue paper is activatable from a first state to a second state yielding a load elongation curve, said load elongation curve having a bandwidth of at least about 0.5.
20. A tissue paper according to Claim 19, wherein said bandwidth is at least about 0.9.
21. A process for producing an activatable tissue paper, said process comprising the steps of:
 providing a forming wire, said forming wire defining an XY plane and a Z-direction perpendicular thereto, said forming wire having a plurality of upstanding protuberances thereon, said protuberances being upstanding in said Z-direction, said protuberances being elongate in said XY plane, wherein said protuberances have an aspect ratio of at least 10;
 providing an aqueous slurry of cellulosic fibers;
 depositing said aqueous slurry on said forming wire, whereby said aqueous slurry comprises a Z-direction thickness at the point of deposition which is greater than the projection of said protuberances above said forming wire;
 drying said aqueous slurry to yield a high basis weight continuous network and discrete low basis weight regions, said discrete low basis weight regions corresponding in geometry to said protuberances, said discrete low basis weight

regions having a major axis and a minor axis orthogonal thereto, whereby said discrete low basis weight regions have an aspect ratio of at least 10; and removing said aqueous slurry from said cellulosic fibrous structure.

22. A process according to Claim 21 further comprising the step of activating said tissue paper, said step of activating said tissue paper comprising the step of applying opposed tensile forces to said tissue paper, whereby said tissue paper is extended within said XY plane, said direction of said opposed tensile forces being generally perpendicular to said major axis of said protuberances, whereby said cellulosic fibers in said low density zones are displaced upon activation to have at least one free end.

23. A process according to Claim 22, wherein said step of activating said tissue paper comprises the step of two dimensionally auxetically activating said tissue paper.

24. A tissue paper having a basis weight of 10 to 140 grams per square meter, said tissue paper having a plurality of lines of weakness therein, said tissue paper being activatable in a first direction, whereby opposed tensile forces causes strain in said tissue paper parallel to said direction of opposed tensile forces, said thickness of said tissue paper increasing in response to said strain.

25. A tissue paper according to Claim 24, wherein said tissue paper may be elongated to a predetermined strain without reaching a peak load on a load elongation curve in either of two orthogonal directions, said strain in said first direction being at least twice as great as said strain in said second direction.